

## SECTION 6

### ANALYTICAL PROCEDURES

This section lists the procedures and methods that will be used to analyze the environmental samples collected during the sampling effort. All laboratory analytical methods will be performed in accordance with the most current promulgated version of USEPA SW-846 protocols and methods. Table 6.1 lists the anticipated analytical parameters and methods to be employed during the sampling efforts for the DNSC Program. Any site-specific parameters not included in Table 6.1 will be addressed in detail in the project-specific addenda.

#### 6.1 PREVENTIVE MAINTENANCE

All field equipment, instruments, tools, gauges and other items requiring preventative maintenance will be serviced in accordance with the manufacturer's specified recommendations. The laboratory instruments will be maintained as specified in the laboratory's QA Manual. Maintenance records will be documented and traceable to specific equipment at the laboratory.

#### 6.2 CALIBRATION PROCEDURES AND FREQUENCY

6.2.1 Instruments and equipment used to gather, generate, or measure environmental data will be calibrated with sufficient frequency and in such a manner that accuracy and reproducibility of results are consistent with the requirements of this SAP. Calibration procedures and frequency for the analytical procedures are summarized in [Table 6.1](#) and in the standard methods. The calibration procedures will meet or exceed the calibration requirements specified in the respective analytical methods and the requirements presented in USACE EM 200-1-3. Calibrations can also be performed at the start and completion of each test run. Calibration standards used as reference standards will be traceable to the National Institute of Standards and Technology (NIST) or meet the established USEPA criteria, when possible. Calibration, repair, or replacement records will be filed and maintained by the laboratory's personnel performing quality control activities. Calibration records of the assigned laboratory will be filed and maintained at the laboratory location where the work is performed.

6.2.2 Calibration of field instruments and equipment will be performed at approved intervals as specified in the manufacturer's recommendations or more frequently as conditions dictate. All calibrations and maintenance of field equipment will be performed according to the manufacturers recommendations, provided with the instruments and kept on site.

**Table 6.1**  
**Summary of Internal Quality Control and Corrective Action Requirements**

<b>Analytical Method</b>	<b>Parameter</b>	<b>Quality Control Check</b>	<b>Frequency</b>	<b>Acceptable Criteria</b>	<b>Corrective Action</b>
SW-846 1010 or SW-846 1020A	Ignitability	<u>Field QC:</u> This method will only be used for analysis of disposal samples	Field QC samples are not required for disposal samples		
		<u>Laboratory QC:</u> Check Standards	Daily prior to sample analysis	Standard should flash between 26°C and 27°C	- Inspect apparatus. - Check standard and document corrective action - Repeat test
		Duplicate	One per batch of ≤20 samples	± 5°C	- Inspect apparatus. - Check standard and document corrective action - Repeat test
SW-846 1311	TCLP	<u>Field QC:</u> This method will only be used for analysis of disposal samples	Field QC samples are not required for disposal samples		
		<u>Laboratory QC:</u> Extraction Blanks	A minimum of one blank (using the same extraction fluid as used for the samples) must be analyzed for every 20 extractions that have been conducted in an extraction vessel.	Analyte concentrations ≤ PQL	- Reanalyze blank. - If still exceeds criteria, clean work area and reanalyze blank. Do not analyze samples until problem is corrected. Document corrective action. - Reanalyze affected samples. - Reextract blank and samples.

**Table 6.1 (Continued)**  
**Summary of Internal Quality Control and Corrective Action Requirements**

Analytical Method	Parameter	Quality Control Check	Frequency	Acceptable Criteria	Corrective Action
SW-846 6010B (ICP trace)	ICP Metals	Initial Calibration	Prior to analysis of each batch of samples. The use of internal calibration quantitation methods (MSA) shall be employed for metals if: (1) Recovery of the contaminant is not at least 50% and the concentration does not exceed the regulatory level, and (2) The concentration of the contaminant is within 20% of the appropriate regulatory level.	The method of standard additions requires preparing calibration standards in the sample matrix rather than reagent water or blank solution.	Follow corrective action guidance provided in each analytical method.
		Matrix Spikes	A matrix spike shall be performed for each waste type. A minimum of one matrix spike must be analyzed for each analytical batch.	Follow the matrix spike addition guidance provided in each analytical method. Matrix spikes must not be added prior to TCLP extraction of the sample.	Follow corrective action guidance provided in each analytical method.
		<u>Field QC:</u> Equipment Blank (field QC samples are not required for disposal samples)	One per week per site	Analyte concentrations $\leq$ PQL	<ul style="list-style-type: none"> <li>- Check method blank for possible laboratory problem. Document corrective action.</li> <li>- Reanalyze equipment blank</li> <li>- Flag data and discuss in technical report where appropriate</li> </ul>

**Table 6.1 (Continued)**  
**Summary of Internal Quality Control and Corrective Action Requirements**

Analytical Method	Parameter	Quality Control Check	Frequency	Acceptable Criteria	Corrective Action
SW-846 6010B (ICP trace) (Cont.)	ICP Metals (Cont.)	Field Duplicate (field QC samples are not required for disposal samples)	One per 10 samples per matrix	RPD $\leq$ 50% for soils and waters	- Review and discuss in technical report - Flag data where appropriate
		<u>Laboratory QC:</u> Initial Calibration	Prior to analysis of each batch of samples	<u>Option 1 - 1 standard and a blank and a low level check standard (at MQL):</u> Low level check standard $\pm 20\%$ of expected value  <u>Option 2 – 3 standards and a blank:</u> $r \geq 0.995$	- Check system. - Document corrective action - Repeat as needed to meet criteria prior to analysis of any samples - Check system. Repeat initial calibration
		Instrumental Precision	Each calibration, ICV and CCV	RSD < 5%	- Check system. - Document corrective action - Repeat as needed to meet criteria prior to analysis of any samples - Check system. Repeat initial calibration
		ICV	After initial calibration	%R $\pm 10\%$ of expected value	- Check system. - Document corrective action - Repeat ICV - Repeat initial calibration
		Continuing Calibration Check	Every 10 samples and at end of analytical sequence	$\pm 10\%$ of expected value	- Check system. - Document corrective action. - Repeat calibration check - If still unacceptable, repeat initial calibration and reanalyze affected samples

**Table 6.1 (Continued)**  
**Summary of Internal Quality Control and Corrective Action Requirements**

<b>Analytical Method</b>	<b>Parameter</b>	<b>Quality Control Check</b>	<b>Frequency</b>	<b>Acceptable Criteria</b>	<b>Corrective Action</b>
SW-846 6010B (ICP trace) (Cont.)	ICP Metals (Cont.)	Initial and continuing calibration blank (ICB & CCB)	10% or every 2 hours during run, minimum of the beginning and end of each run	Concentration of analytes < MDL	<ul style="list-style-type: none"> <li>- Check system.</li> <li>- Recalibrate.</li> <li>- Reanalyze affected samples.</li> <li>- Flag data as appropriate.</li> </ul>
		Interference check samples	Beginning and end of each analysis run	% recovery $\pm$ 20 for target analytes present	<ul style="list-style-type: none"> <li>- Check system</li> <li>- Recalibrate.</li> <li>- Reanalyze preceding samples.</li> </ul>
		Method blank	One per sample batch	Concentration of analytes < 1/2 PQL	<ul style="list-style-type: none"> <li>- Reanalyze blank.</li> <li>- If still exceeds criteria, clean work area and reanalyze blank. Do not analyze samples until problem is corrected. Document corrective action.</li> <li>- Reanalyze affected samples.</li> </ul>
		LCS	One per batch of $\leq$ 20 samples	%R 80% - 120%, with 2 individual analytes allowed outside this range for ICP Metals and 1 individual analyte allowed outside this range for TCLP ICP Metals	<ul style="list-style-type: none"> <li>- Check calibration</li> <li>- Reextract and reanalyze LCS and associated samples</li> <li>- Discuss in case narrative and flag data</li> </ul>
		MS/MSD	One pair per batch of $\leq$ 20 from each site (only MS is needed for TCLP samples)	%R 75-125% except where sample concentration exceeds spike concentration by $\geq$ 4x. MS/MSD RPD $\leq$ 20%	<ul style="list-style-type: none"> <li>- Analyze post digestion spike sample.</li> <li>- Check LCS.</li> <li>- Flag data if LCS is acceptable.               <ul style="list-style-type: none"> <li>- If LCS is unacceptable, re-extract and reanalyze all samples associated with LCS and MS/MSD.</li> <li>- Discuss in case narrative.</li> </ul> </li> </ul>

**Table 6.1 (Continued)**  
**Summary of Internal Quality Control and Corrective Action Requirements**

Analytical Method	Parameter	Quality Control Check	Frequency	Acceptable Criteria	Corrective Action
SW-846 6010B (ICP trace) (Cont.)	ICP Metals (Cont.)	Serial Dilution	One per batch of $\leq 20$ samples	$\pm 10\%$ of original determination	Flag the data
		Post digestion spike	Once per sample batch on MS sample	%R 75-125%	Flag the data
		Method of standard Additions (MSA)	As needed for samples with suspected or confirmed matrix effects	Correlation coefficient is $\geq 0.995$	<ul style="list-style-type: none"> <li>- Use MSA to calculate sample results.</li> <li>- Use three standard additions containing 50, 100, and 150% of expected concentrations.</li> <li>- Flag and discuss within case narrative.</li> </ul>
SW-846 7470A/7471A	CVAA Metals	<u>Field QC:</u> Equipment Blank (field QC samples are not required for disposal samples)	One per week per site	Analyte concentrations $\leq$ PQL	<ul style="list-style-type: none"> <li>- Check method blank for possible laboratory problem. Document corrective action.</li> <li>- If method blank is unacceptable, reanalyze equipment unsafe and associated samples</li> <li>- Flag data and discuss in case narrative and technical report, as appropriate.</li> </ul>
		Field Duplicate (field QC samples are not required for disposal samples)	One per 10 samples per matrix	RPD $\leq 50\%$ for soils and waters	<ul style="list-style-type: none"> <li>- Review and discuss in technical report</li> <li>- Flag data where appropriate</li> </ul>

**Table 6.1 (Continued)**  
**Summary of Internal Quality Control and Corrective Action Requirements**

Analytical Method	Parameter	Quality Control Check	Frequency	Acceptable Criteria	Corrective Action
SW-846 7470A/7471A (Cont.)	CVAA Metals (Cont)	<u>Laboratory QC:</u> Initial Calibration Five standards and a calibration blank	Prior to analysis of each batch of samples	$r \geq 0.995$	<ul style="list-style-type: none"> <li>- Check system.</li> <li>- Document corrective action</li> <li>- Repeat as needed to meet criteria prior to analysis of any samples</li> </ul>
		Instrumental Precision	All standards, ICV and CCV	RPD $\pm 10\%$	<ul style="list-style-type: none"> <li>- Check system.</li> <li>- Document corrective action</li> <li>- Repeat as needed to meet criteria prior to analysis of any samples</li> </ul>
		ICV	After initial calibration	%R $\pm 10\%$ of expected value	<ul style="list-style-type: none"> <li>- Check system.</li> <li>- Document corrective action</li> <li>- Repeat ICV</li> <li>- Repeat initial calibration</li> </ul>
		Continuing Calibration Check	Every 10 samples and at end of analytical sequence	%R $\pm 20\%$ of expected value	<ul style="list-style-type: none"> <li>- Check system.</li> <li>- Document corrective action.</li> <li>- Repeat calibration check</li> <li>- If still unacceptable, repeat initial calibration and reanalyze affected samples</li> </ul>
		Initial and continuing calibration blank (ICB & CCB)	10% or every 2 hours during run, minimum of the beginning and end of each run	Concentration of analytes < MDL	<ul style="list-style-type: none"> <li>- Check system.</li> <li>- Recalibrate.</li> <li>- Reanalyze affected samples.</li> <li>- Flag data as appropriate.</li> </ul>

**Table 6.1 (Continued)**  
**Summary of Internal Quality Control and Corrective Action Requirements**

<b>Analytical Method</b>	<b>Parameter</b>	<b>Quality Control Check</b>	<b>Frequency</b>	<b>Acceptable Criteria</b>	<b>Corrective Action</b>
SW-846 7470A/7471A (Cont.)	CVAA Metals (Cont.)	Method blank	One per sample batch	Concentration of analytes < ½ PQL	<ul style="list-style-type: none"> <li>- Reanalyze blank.</li> <li>- If still exceeds criteria, clean work area and reanalyze blank. Do not analyze samples until problem is corrected. Document corrective action.</li> <li>- Reanalyze affected samples.</li> </ul>
		LCS	One per batch of ≤20 samples	%R 80% - 120%	<ul style="list-style-type: none"> <li>- Check calibration</li> <li>- Reextract and reanalyze LCS and associated samples</li> <li>- Discuss in case narrative and flag data</li> </ul>
		MS/MSD	One pair per batch of ≤20 from each site (only MS is needed for TCLP samples)	%R 80-120% except where sample concentration exceeds spike concentration by ≥4x. MS/MSD RPD ≤ 20%	<ul style="list-style-type: none"> <li>- Analyze post digestion spike sample.</li> <li>- Check LCS.</li> <li>- Flag data if LCS is acceptable.</li> <li>- If LCS is unacceptable, re-extract and reanalyze all samples associated with LCS and MS/MSD.</li> <li>- Discuss in case narrative.</li> </ul>
		Serial Dilutions	One per batch of ≤20 samples	Results ±10% of original determination	Flag the data
		Post digestion spike	One per batch of ≤20 samples	%R 85-115%	Flag the data



**Table 6.1 (Continued)**  
**Summary of Internal Quality Control and Corrective Action Requirements**

<b>Analytical Method</b>	<b>Parameter</b>	<b>Quality Control Check</b>	<b>Frequency</b>	<b>Acceptable Criteria</b>	<b>Corrective Action</b>
SW-846 8081A	Pesticides	<u>Field QC:</u> Equipment Blank (field QC samples are not required for disposal samples)	One per week per site	Analyte concentrations $\leq$ PQL	- Check method blank for possible laboratory problem. Document corrective action. - Reanalyze equipment blank - Flag data and discuss in technical report where appropriate
		Field Duplicate (field QC samples are not required for disposal samples)	One per 10 samples per matrix	RPD $\leq$ 50% for soils and waters	- Review and discuss in technical report - Flag data where appropriate
		<u>Laboratory QC:</u> Initial Calibration	Prior to analysis of initial project samples and as needed afterward	RSD $\leq$ 20% or linear correlation coefficient $>0.99$ for each target compound	- Check system. - Document corrective action - Repeat as needed to meet criteria prior to analysis of any samples
		DDT/Endrin % Breakdown Tests	Prior to analysis once every 12 hour shift	DDT % breakdown $<15\%$ ; Endrin %breakdown $< 15\%$	- Check system. - Document corrective action - Repeat breakdown test - Perform maintenance, re-test
		Initial Calibration Verification	Prior to analysis each 12 hour shift	Relative difference or drift $\leq 15\%$ from initial calibration	- Check system. - Document corrective action. - Repeat ICV analysis. - Repeat initial calibration.

**Table 6.1 (Continued)**  
**Summary of Internal Quality Control and Corrective Action Requirements**

<b>Analytical Method</b>	<b>Parameter</b>	<b>Quality Control Check</b>	<b>Frequency</b>	<b>Acceptable Criteria</b>	<b>Corrective Action</b>
SW-846 8081A (Cont)	Pesticides (Cont.)	Continuing Calibration Check	Every 10 samples	Relative difference or drift $\leq 15\%$ from initial calibration or mean %difference or drift for all targets $< 15\%$ with 2 maximum of two compounds individual % difference or drift $< 30\%$ .	<ul style="list-style-type: none"> <li>- Check system.</li> <li>- Document corrective action.</li> <li>- Repeat calibration check</li> <li>- If still unacceptable, repeat initial calibration and reanalyze affected samples</li> </ul>
		Method Blank	One per batch of $\leq 20$ project samples	Analyte concentrations $\leq \frac{1}{2}$ PQL	<ul style="list-style-type: none"> <li>- Reanalyze blank.</li> <li>- If still exceeds criteria, clean work area and reanalyze blank. Do not analyze samples until problem is corrected. Document corrective action.</li> <li>- Reanalyze affected samples.</li> </ul>
		Surrogate Spikes	Every sample (field, standards, QC, blank)	Percent recovery as shown in Table 3.3	<ul style="list-style-type: none"> <li>- Check calculation and instrument performance.</li> <li>- If still unacceptable, reextract and reanalyze.</li> <li>- Discuss in case narrative and flag data if appropriate</li> </ul>
		Target Analyte Confirmation	Every sample with positive target analyte results	RPD $< 40\%$	<ul style="list-style-type: none"> <li>- Check calculation and instrument performance.</li> <li>- Discuss in case narrative and flag data</li> </ul>

**Table 6.1 (Continued)**  
**Summary of Internal Quality Control and Corrective Action Requirements**

Analytical Method	Parameter	Quality Control Check	Frequency	Acceptable Criteria	Corrective Action
SW-846 8081A (Cont)	Pesticides (Cont.)	LCS	One per batch of $\leq 20$ project samples and when MS/MSD falls outside established limits	Percent recovery as shown in Table 3.2	<ul style="list-style-type: none"> <li>- Check calibration</li> <li>- Reextract and reanalyze LCS and associated samples</li> <li>- Discuss in case narrative and flag data</li> </ul>
		MS/MSD	One pair per batch of $\leq 20$ project samples	Percent recoveries and RPDs as shown in Table 3.2	<ul style="list-style-type: none"> <li>- Flag data if LCS is acceptable.</li> <li>- If LCS is unacceptable, re-extract and reanalyze all samples associated with LCS and MS/MSD.</li> <li>- Discuss in case narrative</li> </ul>
SW-846 8151A	Herbicides	<u>Field QC:</u> Equipment Blank (field QC samples are not required for disposal samples)	One per week per site	Analyte concentrations $\leq$ PQL	<ul style="list-style-type: none"> <li>- Check method blank for possible laboratory problem. Document corrective action.</li> <li>- Reanalyze equipment blank</li> <li>- Flag data and discuss in technical report where appropriate</li> </ul>
		Field Duplicate (field QC samples are not required for disposal samples)	One per 10 samples per matrix	RPD $\leq 50\%$ for soils and waters	<ul style="list-style-type: none"> <li>- Review and discuss in technical report</li> <li>- Flag data where appropriate</li> </ul>
		<u>Laboratory QC:</u> Initial Calibration	Prior to analysis of initial project samples and as needed afterward	RSD $\leq 20\%$ or linear correlation coefficient $> 0.99$ for each target compound	<ul style="list-style-type: none"> <li>- Check system.</li> <li>- Document corrective action</li> <li>- Repeat as needed to meet criteria prior to analysis of any samples</li> </ul>

**Table 6.1 (Continued)**  
**Summary of Internal Quality Control and Corrective Action Requirements**

<b>Analytical Method</b>	<b>Parameter</b>	<b>Quality Control Check</b>	<b>Frequency</b>	<b>Acceptable Criteria</b>	<b>Corrective Action</b>
SW-846 8151A (Cont.)	Herbicides (Cont.)	Initial Calibration Verification	Prior to analysis each 12 hour shift	%D ≤15% from initial calibration	<ul style="list-style-type: none"> <li>- Check system.</li> <li>- Document corrective action.</li> <li>- Repeat ICV analysis.</li> <li>- Repeat initial calibration.</li> </ul>
		Continuing Calibration Check	Every 10 samples	Relative difference or drift ≤15% from initial calibration	<ul style="list-style-type: none"> <li>- Check system.</li> <li>- Document corrective action.</li> <li>- Repeat calibration check</li> <li>- If still unacceptable, repeat initial calibration and reanalyze affected samples</li> </ul>
		Method Blank	One per batch of ≤20 project samples	Analyte concentrations ≤ ½ PQL	<ul style="list-style-type: none"> <li>- Reanalyze blank.</li> <li>- If still exceeds criteria, clean work area and reanalyze blank. Do not analyze samples until problem is corrected. Document corrective action.</li> <li>- Reanalyze affected samples.</li> </ul>
		Surrogate Spikes	Every sample (field, standards, QC, blank)	Percent recovery as shown in Table 3.3	<ul style="list-style-type: none"> <li>- Check calculation and instrument performance.</li> <li>- If still unacceptable, reextract and reanalyze.</li> <li>- Discuss in case narrative and flag data if appropriate</li> </ul>

**Table 6.1 (Continued)**  
**Summary of Internal Quality Control and Corrective Action Requirements**

Analytical Method	Parameter	Quality Control Check	Frequency	Acceptable Criteria	Corrective Action
SW-846 8151A (Cont.)	Herbicides (Cont.)	Target Analyte Confirmation	Every sample with positive target analyte results	RPD < 40%	- Check calculation and instrument performance. - Discuss in case narrative and flag data
		LCS	One per batch of $\leq 20$ project samples and when MS/MSD falls outside established limits	Percent recovery as shown in Table 3.2	- Check calibration - Reextract and reanalyze LCS and associated samples - Discuss in case narrative and flag data
		MS/MSD	One pair per batch of $\leq 20$ project samples	Percent recoveries and RPDs as shown in Table 3.2	- Flag data if LCS is acceptable. - If LCS is unacceptable, re-extract and reanalyze all samples associated with LCS and MS/MSD. - Discuss in case narrative
SW-846 8260B	VOCs	<u>Field QC:</u> Equipment Blank (field QC samples are not required for disposal samples)	One per week per site	Analyte concentrations $\leq$ PQL	- Check method blank for possible laboratory problem. Document corrective action. - Reanalyze equipment blank - Flag data and discuss in technical report where appropriate
		Field Duplicate (field QC samples are not required for disposal samples)	One per 10 samples per matrix	RPD $\leq$ 50% for soils and waters	- Review and discuss in technical report - Flag data where appropriate

**Table 6.1 (Continued)**  
**Summary of Internal Quality Control and Corrective Action Requirements**

Analytical Method	Parameter	Quality Control Check	Frequency	Acceptable Criteria	Corrective Action
SW-846 8260B (Cont.)	VOCs (Cont.)	Trip Blank	One per cooler.	Analyte concentrations $\leq$ PQL	<ul style="list-style-type: none"> <li>- Check method blank for possible laboratory problem. Document corrective action.</li> <li>- Reanalyze trip blank</li> <li>- Flag data and discuss in technical report where appropriate</li> </ul>
		<u>Laboratory QC:</u> BFB tuning check	Every 12 hours	See method	<ul style="list-style-type: none"> <li>- Check system.</li> <li>- Retune as necessary.</li> <li>- Document corrective action.</li> </ul>
		Initial Calibration (ICAL) (linear with 5 points)	Prior to analysis of samples and as needed afterwards	RSD $\leq 15\%$ for each target compound listed in method; Avg RF for SPCCs $\geq 0.30$ for chlorobenzene and 1,1,2,2 tetrachloroethane; $\geq 0.10$ for bromoform, chloromethane and 1,1dichloroethene; RSD $\leq 30\%$ for CCCs	<ul style="list-style-type: none"> <li>- Check system.</li> <li>- Document corrective action.</li> <li>- Repeat as needed to meet criteria prior to analysis of any samples.</li> </ul>
		Initial Calibration Verification (ICV)	Prior to sample analysis once every 12 hour shift to verify the ICAL	RF for SPCCs $\geq 0.30$ for chlorobenzene and 1,1,2,2 tetrachloroethane; $\geq 0.10$ for bromoform, chloromethane and 1,1dichloroethene; %D $\leq 20\%$ for CCCs; IS RT $\pm 30$ seconds; IS areas – 50% to 200% %R for non-SPCC/CCCs is 80-120%	<ul style="list-style-type: none"> <li>- Check system.</li> <li>- Document corrective action.</li> <li>- Repeat ICV analysis.</li> <li>- Repeat initial calibration.</li> </ul>

**Table 6.1 (Continued)**  
**Summary of Internal Quality Control and Corrective Action Requirements**

<b>Analytical Method</b>	<b>Parameter</b>	<b>Quality Control Check</b>	<b>Frequency</b>	<b>Acceptable Criteria</b>	<b>Corrective Action</b>
SW-846 8260B (Cont.)	VOCs (Cont.)	Continuing Calibration Check	Once every 12 hours	Single point RRF within 15% of initial calibration; Average RF for all analytes $\geq 0.30$ except bromoform $\geq 0.10$ ; Percent drift for all analytes $\leq 20\%$	<ul style="list-style-type: none"> <li>- Check system.</li> <li>- Document corrective action.</li> <li>- Repeat calibration check.</li> <li>- If still unacceptable, repeat initial calibration and reanalyze affected samples.</li> </ul>
		Method Blank	One per batch of $\leq 20$ samples	Compound concentration $< \frac{1}{2}$ PQL and $< \text{PQL}$ for common lab contaminants.	<ul style="list-style-type: none"> <li>- Reanalyze blank.</li> <li>- If still exceeds criteria, clean work area and reanalyze blank. Do not analyze samples until problem is corrected. Document corrective action.</li> <li>- Reanalyze affected samples.</li> </ul>
		Surrogate Spikes	Every sample (field, standards, QC, blank)	Percent recoveries as shown in Table 3.3	<ul style="list-style-type: none"> <li>- Check calculation and instrument performance.</li> <li>- If still unacceptable, reextract and reanalyze.</li> <li>- Discuss in case narrative and flag data if appropriate.</li> </ul>
		LCS	One per batch of $\leq 20$ samples and when MS/MSD falls outside established limits	Percent recoveries as shown in Table 3.2 with maximum of 1 compound allowed outside limits.	<ul style="list-style-type: none"> <li>- Check calibration.</li> <li>- Reextract and reanalyze LCS and associated samples.</li> <li>- Discuss in case narrative and flag data.</li> </ul>

**Table 6.1 (Continued)**  
**Summary of Internal Quality Control and Corrective Action Requirements**

<b>Analytical Method</b>	<b>Parameter</b>	<b>Quality Control Check</b>	<b>Frequency</b>	<b>Acceptable Criteria</b>	<b>Corrective Action</b>
SW-846 8260B (Cont.)	VOCs (Cont.)	MS/MSD	One pair per batch of ≤20 samples (only MS is needed for TCLP samples)	Percent recoveries and RPD as shown in Table 3.2	<ul style="list-style-type: none"> <li>- Flag data if LCS is acceptable.</li> <li>- If LCS is unacceptable, re-extract and reanalyze all samples associated with LCS and MS/MSD.</li> <li>- Discuss in case narrative.</li> </ul>
SW-846 8270C	SVOCs	<u>Field QC:</u> Equipment Blank (field QC samples are not required for disposal samples)	One per week per site	Analyte concentrations ≤PQL, except for common lab contaminants which shall be ≤3x PQL	<ul style="list-style-type: none"> <li>- Check method blank for possible laboratory problem. Document corrective action.</li> <li>- If method blank is unacceptable, reanalyze equipment rinsate and associated samples</li> <li>- Flag data and discuss in case narrative and technical report, as appropriate.</li> </ul>
		Field Duplicate (field QC samples are not required for disposal samples)	One per 10 samples per matrix	RPD ≤ 50% for soils and waters	<ul style="list-style-type: none"> <li>- Review and discuss in technical report.</li> <li>- Flag data where appropriate.</li> </ul>
		<u>Laboratory QC:</u> DFTPP tuning check	Every 12 hours	See method	<ul style="list-style-type: none"> <li>- Retune as necessary.</li> <li>- Document corrective action.</li> </ul>



**Table 6.1 (Continued)**  
**Summary of Internal Quality Control and Corrective Action Requirements**

<b>Analytical Method</b>	<b>Parameter</b>	<b>Quality Control Check</b>	<b>Frequency</b>	<b>Acceptable Criteria</b>	<b>Corrective Action</b>
SW-846 8270C (Cont.)	SVOCs (Cont.)	Initial Calibration (linear with 5 points)	Prior to analysis of samples and as needed afterwards	Mean RSD $\leq 15\%$ for all target compounds; RSD $\leq 30\%$ for CCCs; Average RF for SPCCs $\geq 0.050$ ; $r^2 > 0.99$	- Check system. - Document corrective action. - Repeat as needed to meet criteria prior to analysis of any samples.
		Initial Calibration Verification	Prior to sample analysis once every 12 hour shift to verify the ICAL	%D $\leq 20\%$ for CCCs; RF for SPCCs $\geq 0.050$ %R for non SPCC/CCC compounds is 70-130%	- Check system. - Document corrective action. - Repeat ICV analysis. - Repeat initial calibration.
		Continuing Calibration Check	Every 12 hours	Single point RRF within 15% of initial calibration; RSD $\leq 30\%$ and percent drift $< 20\%$ for all compounds; Average RF for all compounds $\geq 0.050$	- Check system. - Document corrective action. - Repeat calibration check. - If still unacceptable, repeat initial calibration and reanalyze affected samples.
		Method Blank	One per batch (maximum of 20 samples per batch) or 1 per day, whichever is more frequent.	Compound concentration $< \frac{1}{2}$ PQL and $< \text{PQL}$ for common lab contaminants.	- Reanalyze blank. - If still exceeds criteria, clean work area and reanalyze blank. Do not analyze samples until problem is corrected. Document corrective action. - Reanalyze affected samples.

**Table 6.1 (Continued)**  
**Summary of Internal Quality Control and Corrective Action Requirements**

<b>Analytical Method</b>	<b>Parameter</b>	<b>Quality Control Check</b>	<b>Frequency</b>	<b>Acceptable Criteria</b>	<b>Corrective Action</b>
SW-846 8270C (Cont.)	SVOCs (Cont.)	Surrogate Spikes	Every sample (field, standards, QC, blank)	Percent recoveries as shown in Table 3.3	<ul style="list-style-type: none"> <li>- Check calculation and instrument performance.</li> <li>- If still unacceptable, reextract and reanalyze.</li> <li>- Discuss in case narrative and flag data if appropriate</li> </ul>
		LCS	One per batch of $\leq 20$ samples and when MS/MSD falls outside established limits	Percent recoveries as shown in Table 3.2 with maximum of 1 compound outside limits.	<ul style="list-style-type: none"> <li>- Check calibration.</li> <li>- Reextract and reanalyze LCS and associated samples.</li> <li>- Discuss in case narrative and flag data if appropriate.</li> </ul>
		MS/MSD	One pair per batch of $\leq 20$ samples (only MS is needed for TCLP samples)	Percent recoveries and RPD as shown in Table 3.2	<ul style="list-style-type: none"> <li>- Flag data if LCS is acceptable.</li> <li>- If LCS is unacceptable, re-extract and reanalyze samples associated with LCS and MS/MSD.</li> <li>- Discuss in case narrative.</li> </ul>
SW-846 9045C	Corrosivity	<u>Field QC:</u> Equipment Blank (field QC samples are not required for disposal samples)	One per week per site	Analyte concentrations $\leq$ PQL	<ul style="list-style-type: none"> <li>- Check method blank for possible laboratory problem. Document corrective action.</li> <li>- If method blank is unacceptable, reanalyze equipment rinsate and associated samples</li> <li>- Flag data and discuss in case narrative and technical report.</li> </ul>

**Table 6.1 (Continued)**  
**Summary of Internal Quality Control and Corrective Action Requirements**

<b>Analytical Method</b>	<b>Parameter</b>	<b>Quality Control Check</b>	<b>Frequency</b>	<b>Acceptable Criteria</b>	<b>Corrective Action</b>
SW-846 9045C (Cont.)	Corrosivity (Cont.)	Field Duplicate (field QC samples are not required for disposal samples)	One per 10 samples per matrix	RPD $\leq$ 50% for soils and waters	- Review and discuss in technical report. - Flag data where appropriate.
		<u>Laboratory QC:</u> Initial Calibration (Calibration with pH 4 and pH 10)	Prior to analysis of samples and as needed afterwards	Values within 0.2 pH units of the expected value.	- Check system. - Document corrective action. - Repeat as needed to meet criteria prior to analysis of any samples.
		Calibration Verification with pH 7	Once per batch of $\leq 10$ samples	Values within 0.2 pH units of the expected value	- Check system. - Document corrective action. - Repeat calibration verification. - If still unacceptable, repeat initial calibration and reanalyze affected samples.
		Duplicate	Once per batch of 10 samples	Values within $\pm 0.1$ pH units of the expected value.	Check system. - Document corrective action. - Repeat calibration verification. - If still unacceptable, repeat initial calibration and reanalyze affected samples.
SW-846 8082	PCB	<u>Field QC:</u> Equipment Blank (field QC samples are not required for disposal samples)	One per week per site	Analyte concentrations $\leq$ PQL	- Check method blank for possible laboratory problem. Document corrective action. - Reanalyze equipment blank - Flag data and discuss in technical report where appropriate

**Table 6.1 (Continued)**  
**Summary of Internal Quality Control and Corrective Action Requirements**

<b>Analytical Method</b>	<b>Parameter</b>	<b>Quality Control Check</b>	<b>Frequency</b>	<b>Acceptable Criteria</b>	<b>Corrective Action</b>
SW-846 8082 (Cont.)	PCB (Cont.)	Field Duplicate (field QC samples are not required for disposal samples)	One per 10 samples per matrix	$RPD \leq 50\%$ for soils and waters	- Review and discuss in technical report - Flag data where appropriate
		<u>Laboratory QC:</u> Initial Calibration	Prior to analysis of initial project samples and as needed afterward	$RSD \leq 20\%$ or linear correlation coefficient $>0.99$ for each target compound	- Check system. - Document corrective action - Repeat as needed to meet criteria prior to analysis of any samples
		Initial Calibration Verification	Prior to analysis each 12 hour shift	Relative difference or drift $\leq 15\%$ from initial calibration	- Check system. - Document corrective action. - Repeat ICV analysis. - Repeat initial calibration.
		Continuing Calibration Check	Every 10 samples	Relative difference or drift $\leq 15\%$ from initial calibration or mean %difference or drift for all targets $<15\%$	- Check system. - Document corrective action. - Repeat calibration check - If still unacceptable, repeat initial calibration and reanalyze affected samples

**Table 6.1 (Continued)**  
**Summary of Internal Quality Control and Corrective Action Requirements**

<b>Analytical Method</b>	<b>Parameter</b>	<b>Quality Control Check</b>	<b>Frequency</b>	<b>Acceptable Criteria</b>	<b>Corrective Action</b>
SW-846 8082 (Cont.)	PCB (Cont.)	Method Blank	One per batch of $\leq 20$ project samples	Analyte concentrations $\leq \frac{1}{2}$ PQL	<ul style="list-style-type: none"> <li>- Reanalyze blank.</li> <li>- If still exceeds criteria, clean work area and reanalyze blank. Do not analyze samples until problem is corrected. Document corrective action.</li> <li>- Reanalyze affected samples.</li> </ul>
		Surrogate Spikes	Every sample (field, standards, QC, blank)	Percent recovery as shown in Table 3.3	<ul style="list-style-type: none"> <li>- Check calculation and instrument performance.</li> <li>- If still unacceptable, reextract and reanalyze.</li> <li>- Discuss in case narrative and flag data if appropriate</li> </ul>
		Target Analyte Confirmation	Every sample with positive target analyte results	RPD < 40%	<ul style="list-style-type: none"> <li>- Check calculation and instrument performance.</li> <li>- Discuss in case narrative and flag data</li> </ul>
		LCS	One per batch of $\leq 20$ project samples and when MS/MSD falls outside established limits	Percent recovery as shown in Table 3.2	<ul style="list-style-type: none"> <li>- Check calibration</li> <li>- Reextract and reanalyze LCS and associated samples</li> <li>- Discuss in case narrative and flag data</li> </ul>

**Table 6.1 (Continued)**  
**Summary of Internal Quality Control and Corrective Action Requirements**

<b>Analytical Method</b>	<b>Parameter</b>	<b>Quality Control Check</b>	<b>Frequency</b>	<b>Acceptable Criteria</b>	<b>Corrective Action</b>
SW-846 8082 (Cont.)	PCB (Cont.)	MS/MSD	One pair per batch of $\leq 20$ project samples	Percent recoveries and RPDs as shown in Table 3.2	<ul style="list-style-type: none"> <li>- Flag data if LCS is acceptable.</li> <li>- If LCS is unacceptable, re-extract and reanalyze all samples associated with LCS and MS/MSD.</li> <li>- Discuss in case narrative</li> </ul>
SW-846 9060 / Lloyd Kahn	Total Organic Carbon	<u>Field QC:</u> Equipment Blank (field QC samples are not required for disposal samples)	One per week per site	Analyte concentrations $\leq$ PQL	<ul style="list-style-type: none"> <li>- Check method blank for possible laboratory problem. Document corrective action.</li> <li>- Reanalyze equipment blank</li> <li>- Flag data and discuss in technical report where appropriate</li> </ul>
		Field Duplicate (field QC samples are not required for disposal samples)	One per 10 samples per matrix	RPD $\leq 50\%$ for soils and waters	<ul style="list-style-type: none"> <li>- Review and discuss in technical report</li> <li>- Flag data where appropriate</li> </ul>
		<u>Laboratory QC:</u> Initial Calibration (four standards and a blank)	Per instrument manufacturer's specification	Correlation coefficient is $\geq 0.995$	<ul style="list-style-type: none"> <li>- Check system.</li> <li>- Document corrective action</li> <li>- Repeat as needed to meet criteria prior to analysis of any samples</li> </ul>

**Table 6.1 (Continued)**  
**Summary of Internal Quality Control and Corrective Action Requirements**

<b>Analytical Method</b>	<b>Parameter</b>	<b>Quality Control Check</b>	<b>Frequency</b>	<b>Acceptable Criteria</b>	<b>Corrective Action</b>
SW-846 9060 (Cont.)	Total Organic Carbon (Cont.)	Initial Calibration Verification	Prior to sample analysis	Value of the second source within 10% of the expected value	<ul style="list-style-type: none"> <li>- Check system.</li> <li>- Document corrective action.</li> <li>- Repeat ICV analysis.</li> <li>- Repeat initial calibration.</li> </ul>
		Continuing Calibration Check	Every 10 samples	Value within 10% of the expected value	<ul style="list-style-type: none"> <li>- Check system.</li> <li>- Document corrective action.</li> <li>- Repeat calibration check</li> <li>- If still unacceptable, repeat initial calibration and reanalyze affected samples</li> </ul>
		Method Blank	One per batch of $\leq 20$ project samples	Analyte concentrations $\leq \frac{1}{2}$ PQL	<ul style="list-style-type: none"> <li>- Reanalyze blank.</li> <li>- If still exceeds criteria, clean work area and reanalyze blank. Do not analyze samples until problem is corrected. Document corrective action.</li> <li>- Reanalyze affected samples.</li> </ul>
		LCS	One per batch of $\leq 20$ project samples and when MS/MSD falls outside established limits	Recovery 85% - 115%	<ul style="list-style-type: none"> <li>- Check calibration</li> <li>- Reextract and reanalyze LCS and associated samples</li> <li>- Discuss in case narrative and flag data</li> </ul>

**Table 6.1 (Continued)**  
**Summary of Internal Quality Control and Corrective Action Requirements**

<b>Analytical Method</b>	<b>Parameter</b>	<b>Quality Control Check</b>	<b>Frequency</b>	<b>Acceptable Criteria</b>	<b>Corrective Action</b>
SW-846 9060 (Cont.)	Total Organic Carbon (Cont.)	MS	One pair per batch of $\leq 10$ project samples	Water- Recovery 80% - 120% Soil - Recovery 66% - 121%	- Flag data if LCS is acceptable. - If LCS is unacceptable, re-extract and reanalyze all samples associated with LCS and MS/MSD. - Discuss in case narrative
		MSD or Sample Duplicate	One pair per batch of $\leq 10$ project samples	Water – $RPD \leq 20$ Soil – $RPD \leq 25$	- Flag data - Discuss in case narrative
SW-846 8015B	Total Petroleum Hydrocarbon	Field QC: Equipment Blank (field QC samples are not required for disposal samples)	One per week per site	Analyte concentrations $\leq$ PQL	- Check method blank for possible laboratory problem. Document corrective action. - Reanalyze equipment blank - Flag data and discuss in technical report where appropriate
		Field Duplicate (field QC samples are not required for disposal samples)	One per 10 samples per matrix	$RPD \leq 50\%$ for soils and waters	- Review and discuss in technical report - Flag data where appropriate



**Table 6.1 (Continued)**  
**Summary of Internal Quality Control and Corrective Action Requirements**

<b>Analytical Method</b>	<b>Parameter</b>	<b>Quality Control Check</b>	<b>Frequency</b>	<b>Acceptable Criteria</b>	<b>Corrective Action</b>
SW-846 8015B (Cont.)	Total Petroleum Hydrocarbon (Cont.)	<u>Laboratory QC:</u> Initial Calibration	Prior to analysis of initial project samples and as needed afterward	RSD $\leq$ 20% or linear correlation coefficient $>0.995$	<ul style="list-style-type: none"> <li>- Check system.</li> <li>- Document corrective action</li> <li>- Repeat as needed to meet criteria prior to analysis of any samples</li> </ul>
		Initial Calibration Verification	Once after each initial calibration	Relative difference or drift $\leq$ 15% from initial calibration	<ul style="list-style-type: none"> <li>- Check system.</li> <li>- Document corrective action.</li> <li>- Repeat ICV analysis.</li> <li>- Repeat initial calibration.</li> </ul>
		Continuing Calibration Check	Every 10 samples	Relative difference or drift $\leq$ 15% from initial calibration	<ul style="list-style-type: none"> <li>- Check system.</li> <li>- Document corrective action.</li> <li>- Repeat calibration check</li> <li>- If still unacceptable, repeat initial calibration and reanalyze affected samples</li> </ul>
		Method Blank	One per batch of $\leq$ 20 project samples	Analyte concentrations $\leq \frac{1}{2}$ PQL	<ul style="list-style-type: none"> <li>- Reanalyze blank.</li> <li>- If still exceeds criteria, clean work area and reanalyze blank. Do not analyze samples until problem is corrected. Document corrective action.</li> <li>- Reanalyze affected samples.</li> </ul>

**Table 6.1 (Continued)**  
**Summary of Internal Quality Control and Corrective Action Requirements**

<b>Analytical Method</b>	<b>Parameter</b>	<b>Quality Control Check</b>	<b>Frequency</b>	<b>Acceptable Criteria</b>	<b>Corrective Action</b>
SW-846 8015B (Cont.)	Total Petroleum Hydrocarbon (Cont.)	MS/MSD	One pair per batch of $\leq 10$ project samples	Percent recoveries and RPDs as shown in Table 3.2	<ul style="list-style-type: none"> <li>- Flag data if LCS is acceptable.</li> <li>- If LCS is unacceptable, re-extract and reanalyze all samples associated with LCS and MS/MSD.</li> <li>- Discuss in case narrative</li> </ul>
EPA 160.1	Total Dissolved Solid	<u>Field QC:</u> Equipment Blank (field QC samples are not required for disposal samples)	One per week per site	Analyte concentrations $\leq$ PQL	<ul style="list-style-type: none"> <li>- Check method blank for possible laboratory problem. Document corrective action.</li> <li>- Reanalyze equipment blank</li> <li>- Flag data and discuss in technical report where appropriate</li> </ul>
		Field Duplicate (field QC samples are not required for disposal samples)	One per 10 samples per matrix	RPD $\leq 50\%$ for soils and waters	<ul style="list-style-type: none"> <li>- Review and discuss in technical report</li> <li>- Flag data where appropriate</li> </ul>
		<u>Laboratory QC</u> Method Blank	One per batch of $\leq 20$ project samples	Analyte concentrations $\leq \frac{1}{2}$ PQL	<ul style="list-style-type: none"> <li>- Check for possible contamination or calculation error. Document corrective action.</li> <li>- Correct problem, the reprep and reanalyze all samples in the associated preparatory batch</li> <li>- Discuss in case narrative</li> </ul>

**Table 6.1 (Continued)**  
**Summary of Internal Quality Control and Corrective Action Requirements**

<b>Analytical Method</b>	<b>Parameter</b>	<b>Quality Control Check</b>	<b>Frequency</b>	<b>Acceptable Criteria</b>	<b>Corrective Action</b>
EPA 160.1 (Cont.)	Total Dissolved Solid (Cont.)	Sample Duplicate	One pair per batch of $\leq 20$ project samples	Percent recoveries and RPDs as shown in Table 3.2	<ul style="list-style-type: none"> <li>- Flag data</li> <li>- Discuss in case narrative</li> </ul>
EPA 160.2	Total Suspended Solid	<u>Field QC:</u> Equipment Blank (field QC samples are not required for disposal samples)	One per week per site	Analyte concentrations $\leq$ PQL	<ul style="list-style-type: none"> <li>- Check method blank for possible laboratory problem. Document corrective action.</li> <li>- Reanalyze equipment blank</li> <li>- Flag data and discuss in technical report where appropriate</li> </ul>
		Field Duplicate (field QC samples are not required for disposal samples)	One per 10 samples per matrix	RPD $\leq$ 50% for soils and waters	<ul style="list-style-type: none"> <li>- Review and discuss in technical report</li> <li>- Flag data where appropriate</li> </ul>
		<u>Laboratory QC</u> Method Blank	One per batch of $\leq 20$ project samples	Analyte concentrations $\leq \frac{1}{2}$ PQL	<ul style="list-style-type: none"> <li>- Check for possible contamination or calculation error. Document corrective action.</li> <li>- Correct problem, the reprep and reanalyze all samples in the associated preparatory batch</li> <li>- Discuss in case narrative</li> </ul>

**Table 6.1 (Continued)**  
**Summary of Internal Quality Control and Corrective Action Requirements**

<b>Analytical Method</b>	<b>Parameter</b>	<b>Quality Control Check</b>	<b>Frequency</b>	<b>Acceptable Criteria</b>	<b>Corrective Action</b>
EPA 160.2 (Cont.)	Total Suspended Solid (Cont.)	Sample Duplicate	One pair per batch of $\leq 20$ project samples	Percent recoveries and RPDs as shown in Table 3.2	<ul style="list-style-type: none"> <li>- Flag data</li> <li>- Discuss in case narrative</li> </ul>
EPA 405.1	BOD, 5-Day	<u>Field QC:</u> Equipment Blank (field QC samples are not required for disposal samples)	One per week per site	Analyte concentrations $\leq$ PQL	<ul style="list-style-type: none"> <li>- Check method blank for possible laboratory problem. Document corrective action.</li> <li>- Reanalyze equipment blank</li> <li>- Flag data and discuss in technical report where appropriate</li> </ul>
		<u>Laboratory QC</u> Method Blank	One per batch of $\leq 20$ project samples	Analyte concentrations $\leq \frac{1}{2}$ PQL	<ul style="list-style-type: none"> <li>- Check for possible contamination or calculation error. Document corrective action.</li> <li>- Correct problem, the reprep and reanalyze all samples in the associated preparatory batch</li> <li>- Discuss in case narrative</li> </ul>
		LCS	One per batch of $\leq 20$ project samples	Percent recoveries and RPDs as shown in Table 3.2	<ul style="list-style-type: none"> <li>- Check for possible contamination or calculation error. Document corrective action.</li> <li>- Correct problem, the reprep and reanalyze all samples in the associated preparatory batch</li> <li>- Discuss in case narrative</li> </ul>

**Table 6.1 (Continued)**  
**Summary of Internal Quality Control and Corrective Action Requirements**

<b>Analytical Method</b>	<b>Parameter</b>	<b>Quality Control Check</b>	<b>Frequency</b>	<b>Acceptable Criteria</b>	<b>Corrective Action</b>
EPA 405.1 (Cont)	BOD, 5-Day (Cont)	Sample Duplicate	One pair per batch of $\leq 20$ project samples	Percent recoveries and RPDs as shown in Table 3.2	<ul style="list-style-type: none"> <li>- Flag data</li> <li>- Discuss in case narrative</li> </ul>
		<u>Field QC:</u> Equipment Blank (field QC samples are not required for disposal samples)	One per week per site	Analyte concentrations $\leq$ PQL	<ul style="list-style-type: none"> <li>- Check method blank for possible laboratory problem. Document corrective action.</li> <li>- Reanalyze equipment blank</li> <li>- Flag data and discuss in technical report where appropriate</li> </ul>
		Field Duplicate (field QC samples are not required for disposal samples)	One per 10 samples per matrix	RPD $\leq$ 50% for soils and waters	<ul style="list-style-type: none"> <li>- Review and discuss in technical report</li> <li>- Flag data where appropriate</li> </ul>
		<u>Laboratory QC</u> Method Blank	One per batch of $\leq 20$ project samples	Analyte concentrations $\leq \frac{1}{2}$ PQL	<ul style="list-style-type: none"> <li>- Check for possible contamination or calculation error. Document corrective action.</li> <li>- Correct problem, the reprep and reanalyze all samples in the associated preparatory batch</li> <li>- Discuss in case narrative</li> </ul>
		LCS	One per batch of $\leq 20$ project samples	Percent recoveries and RPDs as shown in Table 3.2	<ul style="list-style-type: none"> <li>- Check for possible contamination or calculation error. Document corrective action.</li> <li>- Correct problem, the reprep and reanalyze all samples in the associated preparatory batch</li> <li>- Discuss in case narrative</li> </ul>

**Table 6.1 (Continued)**  
**Summary of Internal Quality Control and Corrective Action Requirements**

<b>Analytical Method</b>	<b>Parameter</b>	<b>Quality Control Check</b>	<b>Frequency</b>	<b>Acceptable Criteria</b>	<b>Corrective Action</b>
EPA 405.1 (Cont)	BOD, 5-Day (Cont)	Sample Duplicate	One pair per batch of $\leq 20$ project samples	Percent recoveries and RPDs as shown in Table 3.2	<ul style="list-style-type: none"> <li>- Flag data</li> <li>- Discuss in case narrative</li> </ul>
EPA 410.4	COD	<u>Field QC:</u>  Equipment Blank (field QC samples are not required for disposal samples)	One per week per site	Analyte concentrations $\leq$ PQL	<ul style="list-style-type: none"> <li>- Check method blank for possible laboratory problem. Document corrective action.</li> <li>- Reanalyze equipment blank</li> <li>- Flag data and discuss in technical report where appropriate</li> </ul>
		Field Duplicate (field QC samples are not required for disposal samples)	One per 10 samples per matrix	RPD $\leq 50\%$ for soils and waters	<ul style="list-style-type: none"> <li>- Review and discuss in technical report</li> <li>- Flag data where appropriate</li> </ul>
		<u>Laboratory QC</u>  Initial Calibration Verification	Before beginning a sample run	Value within $\pm 10\%$ of true value	<ul style="list-style-type: none"> <li>- Check system.</li> <li>- Document corrective action.</li> <li>- Repeat ICV analysis.</li> <li>- Repeat initial calibration.</li> </ul>
		Method Blank	One per batch of $\leq 20$ project samples	Analyte concentrations $\leq \frac{1}{2}$ PQL	<ul style="list-style-type: none"> <li>- Check for possible contamination or calculation error. Document corrective action.</li> <li>- Correct problem, the reprep and reanalyze all samples in the associated preparatory batch</li> <li>- Discuss in case narrative</li> </ul>

**Table 6.1 (Continued)**  
**Summary of Internal Quality Control and Corrective Action Requirements**

Analytical Method	Parameter	Quality Control Check	Frequency	Acceptable Criteria	Corrective Action
EPA 410.4 (Cont)	COD (Cont)	Sample Duplicate	One pair per batch of $\leq 20$ project samples	Percent recoveries and RPDs as shown in Table 3.2	<ul style="list-style-type: none"> <li>- Flag data</li> <li>- Discuss in case narrative</li> </ul>
EPA 150.1	pH	<u>Field QC:</u> Equipment Blank (field QC samples are not required for disposal samples)	One per week per site	Analyte concentrations $\leq$ PQL	<ul style="list-style-type: none"> <li>- Check method blank for possible laboratory problem. Document corrective action.</li> <li>- If method blank is unacceptable, reanalyze equipment rinsate and associated samples</li> <li>- Flag data and discuss in case narrative and technical report.</li> </ul>
		Field Duplicate (field QC samples are not required for disposal samples)	One per 10 samples per matrix	RPD $\leq$ 50% for soils and waters	<ul style="list-style-type: none"> <li>- Review and discuss in technical report.</li> <li>- Flag data where appropriate.</li> </ul>
		<u>Laboratory QC:</u> Initial Calibration (Calibration with pH 4 and pH 10)	Prior to analysis of samples and as needed afterwards	Values within 0.05 pH units of the expected value.	<ul style="list-style-type: none"> <li>- Check system.</li> <li>- Document corrective action.</li> <li>- Repeat as needed to meet criteria prior to analysis of any samples.</li> </ul>
		Calibration Verification with pH 7	Once per batch of $\leq 10$ samples	Values within 0.05 pH units of the expected value	<ul style="list-style-type: none"> <li>- Check system.</li> <li>- Document corrective action.</li> <li>- Repeat calibration verification.</li> <li>- If still unacceptable, repeat initial calibration and reanalyze affected samples.</li> </ul>

**Table 6.1 (Continued)**  
**Summary of Internal Quality Control and Corrective Action Requirements**

<b>Analytical Method</b>	<b>Parameter</b>	<b>Quality Control Check</b>	<b>Frequency</b>	<b>Acceptable Criteria</b>	<b>Corrective Action</b>
EPA 150.1 (Cont.)	pH (Cont.)	Duplicate	Once per batch of 10 samples	Percent recoveries and RPDs as shown in Table 3.2	Check system. - Document corrective action. - Repeat calibration verification. - If still unacceptable, repeat initial calibration and reanalyze affected samples.
EPA 413.1 and 1664A	Oil & Grease	<u>Field QC:</u> Equipment Blank (field QC samples are not required for disposal samples)	One per week per site	Analyte concentrations $\leq$ PQL	- Check method blank for possible laboratory problem. Document corrective action. - Reanalyze equipment blank - Flag data and discuss in technical report where appropriate
		Field Duplicate (field QC samples are not required for disposal samples)	One per 10 samples per matrix	RPD $\leq$ 50% for soils and waters	- Review and discuss in technical report - Flag data where appropriate
		MS	One pair per batch of $\leq$ 20 project samples	Percent recoveries and RPDs as shown in Table 3.2	- Flag data if LCS is acceptable. - If LCS is unacceptable, re-extract and reanalyze all samples associated with LCS and MS/MSD. - Discuss in case narrative
		MSD/Sample Duplicate	One pair per batch of $\leq$ 20 project samples	Percent recoveries and RPDs as shown in Table 3.2	- Flag data - Discuss in case narrative



**Table 6.1 (Continued)**  
**Summary of Internal Quality Control and Corrective Action Requirements**

<b>Analytical Method</b>	<b>Parameter</b>	<b>Quality Control Check</b>	<b>Frequency</b>	<b>Acceptable Criteria</b>	<b>Corrective Action</b>
EPA 350.1	Ammonia as N	<u>Field QC:</u> Equipment Blank (field QC samples are not required for disposal samples)	One per week per site	Analyte concentrations $\leq$ PQL	- Check method blank for possible laboratory problem. Document corrective action. - Reanalyze equipment blank - Flag data and discuss in technical report where appropriate
		Field Duplicate (field QC samples are not required for disposal samples)	One per 10 samples per matrix	RPD $\leq$ 50% for soils and waters	- Review and discuss in technical report - Flag data where appropriate
		<u>Laboratory QC:</u> Initial Calibration	Prior to analysis of initial project samples and as needed afterward	linear correlation coefficient $>0.995$	- Check system. - Document corrective action - Repeat as needed to meet criteria prior to analysis of any samples
		Initial Calibration Verification	Once after each initial calibration	Value within $\leq 10\%$ of the expected value	- Check system. - Document corrective action. - Repeat ICV analysis. - Repeat initial calibration.
		Continuing Calibration Check	Every 10 samples	Value within $\leq 10\%$ of the expected value	- Check system. - Document corrective action. - Repeat calibration check - If still unacceptable, repeat initial calibration and reanalyze affected samples

**Table 6.1 (Continued)**  
**Summary of Internal Quality Control and Corrective Action Requirements**

<b>Analytical Method</b>	<b>Parameter</b>	<b>Quality Control Check</b>	<b>Frequency</b>	<b>Acceptable Criteria</b>	<b>Corrective Action</b>
EPA 350.1 (Cont.)	Ammonia as N (Cont.)	Method Blank	One per batch of $\leq 20$ project samples	Analyte concentrations $\leq \frac{1}{2}$ PQL	<ul style="list-style-type: none"> <li>- Reanalyze blank.</li> <li>- If still exceeds criteria, clean work area and reanalyze blank. Do not analyze samples until problem is corrected. Document corrective action.</li> <li>- Reanalyze affected samples.</li> </ul>
		LCS	One per batch of $\leq 20$ project samples and when MS/MSD falls outside established limits	Percent recoveries and RPDs as shown in Table 3.2	<ul style="list-style-type: none"> <li>- Check calibration</li> <li>- Reextract and reanalyze LCS and associated samples</li> <li>- Discuss in case narrative and flag data</li> </ul>
		MS/MSD	One pair per batch of $\leq 10$ project samples	Percent recoveries and RPDs as shown in Table 3.2	<ul style="list-style-type: none"> <li>- Flag data if LCS is acceptable.</li> <li>- If LCS is unacceptable, re-extract and reanalyze all samples associated with LCS and MS/MSD.</li> <li>- Discuss in case narrative</li> </ul>
EPA 330.5	Total residual Chlorine	<u>Field QC:</u> Equipment Blank (field QC samples are not required for disposal samples)	One per week per SITE	Analyte concentrations $\leq$ PQL	<ul style="list-style-type: none"> <li>- Check method blank for possible laboratory problem. Document corrective action.</li> <li>- Reanalyze equipment blank</li> <li>- Flag data and discuss in technical report where appropriate</li> </ul>

**Table 6.1 (Continued)**  
**Summary of Internal Quality Control and Corrective Action Requirements**

<b>Analytical Method</b>	<b>Parameter</b>	<b>Quality Control Check</b>	<b>Frequency</b>	<b>Acceptable Criteria</b>	<b>Corrective Action</b>
EPA 330.5 (Cont.)	Total residual Chlorine (Cont.)	Field Duplicate (field QC samples are not required for disposal samples)	One per 10 samples per matrix	RPD $\leq$ 50% for soils and waters	- Review and discuss in technical report - Flag data where appropriate
		<u>Laboratory QC:</u> Initial Calibration	Prior to analysis of initial project samples and as needed afterward	linear correlation coefficient $>0.995$	- Check system. - Document corrective action - Repeat as needed to meet criteria prior to analysis of any samples
		Initial Calibration Verification	Once after each initial calibration	Value within $\leq 10\%$ of the expected value	- Check system. - Document corrective action. - Repeat ICV analysis. - Repeat initial calibration.
		Continuing Calibration Check	Every 10 samples	Value within $\leq 10\%$ of the expected value	- Check system. - Document corrective action. - Repeat calibration check - If still unacceptable, repeat initial calibration and reanalyze affected samples
		Method Blank	One per batch of $\leq 20$ project samples	Analyte concentrations $\leq \frac{1}{2}$ PQL	- Reanalyze blank. - If still exceeds criteria, clean work area and reanalyze blank. Do not analyze samples until problem is corrected. Document corrective action. - Reanalyze affected samples.

**Table 6.1 (Continued)**  
**Summary of Internal Quality Control and Corrective Action Requirements**

Analytical Method	Parameter	Quality Control Check	Frequency	Acceptable Criteria	Corrective Action
EPA 330.5 (Cont.)	Total residual Chlorine (Cont.)	LCS	One per batch of $\leq 20$ project samples and when MS/MSD falls outside established limits	Percent recoveries and RPDs as shown in Table 3.2	<ul style="list-style-type: none"> <li>- Check calibration</li> <li>- Reextract and reanalyze LCS and associated samples</li> <li>- Discuss in case narrative and flag data</li> </ul>
		MS/MSD	One pair per batch of $\leq 10$ project samples	Percent recoveries and RPDs as shown in Table 3.2	<ul style="list-style-type: none"> <li>- Flag data if LCS is acceptable.</li> <li>- If LCS is unacceptable, re-extract and reanalyze all samples associated with LCS and MS/MSD.</li> <li>- Discuss in case narrative</li> </ul>
EPA 120.1	Specific Conductivity	<u>Field QC:</u> Equipment Blank (field QC samples are not required for disposal samples)	One per week per SITE	Analyte concentrations $\leq$ PQL	<ul style="list-style-type: none"> <li>- Check method blank for possible laboratory problem. Document corrective action.</li> <li>- Reanalyze equipment blank</li> <li>- Flag data and discuss in technical report where appropriate</li> </ul>
		Field Duplicate (field QC samples are not required for disposal samples)	One per 10 samples per matrix	RPD $\leq 50\%$ for soils and waters	<ul style="list-style-type: none"> <li>- Review and discuss in technical report</li> <li>- Flag data where appropriate</li> </ul>
		<u>Laboratory QC:</u> Initial Calibration	Prior to analysis of initial project samples and as needed afterward	Per instrument manufacturer's specification	<ul style="list-style-type: none"> <li>- Check system.</li> <li>- Document corrective action</li> <li>- Repeat as needed to meet criteria prior to analysis of any samples</li> </ul>
		Initial Calibration Verification	Once after each initial calibration	Value within $\leq 10\%$ of the expected value	<ul style="list-style-type: none"> <li>- Check system.</li> <li>- Document corrective action.</li> <li>- Repeat ICV analysis.</li> <li>- Repeat initial calibration.</li> </ul>

**Table 6.1 (Continued)**  
**Summary of Internal Quality Control and Corrective Action Requirements**

Analytical Method	Parameter	Quality Control Check	Frequency	Acceptable Criteria	Corrective Action
EPA 120.1 (Cont.)	Specific Conductivity (Cont.)	LCS	One per batch of $\leq 20$ project samples and when MS/MSD falls outside established limits	Percent recoveries and RPDs as shown in Table 3.2	<ul style="list-style-type: none"> <li>- Check calibration</li> <li>- Reextract and reanalyze LCS and associated samples</li> <li>- Discuss in case narrative and flag data</li> </ul>
		Duplicate	Once per batch of 10 samples	Percent recoveries and RPDs as shown in Table 3.2	<ul style="list-style-type: none"> <li>- Check system.</li> <li>- Document corrective action.</li> <li>- Repeat calibration verification.</li> <li>- If still unacceptable, repeat initial calibration and reanalyze affected samples.</li> </ul>
SW-846 9010B/9012A	Cyanide	<u>Field QC:</u>	One per week per SITE	Analyte concentrations $\leq$ PQL	<ul style="list-style-type: none"> <li>- Check method blank for possible laboratory problem. Document corrective action.</li> <li>- Reanalyze equipment blank</li> <li>- Flag data and discuss in technical report where appropriate</li> </ul>
		Equipment Blank (field QC samples are not required for disposal samples)			
		Field Duplicate (field QC samples are not required for disposal samples)	One per 10 samples per matrix	RPD $\leq 50\%$ for soils and waters	<ul style="list-style-type: none"> <li>- Review and discuss in technical report</li> <li>- Flag data where appropriate</li> </ul>
		<u>Laboratory QC:</u> Initial Calibration Six standards and a calibration blank	Prior to analysis of each batch of samples	$r \geq 0.995$	<ul style="list-style-type: none"> <li>- Check system.</li> <li>- Document corrective action</li> <li>- Repeat as needed to meet criteria prior to analysis of any samples</li> </ul>

**Table 6.1 (Continued)**  
**Summary of Internal Quality Control and Corrective Action Requirements**

<b>Analytical Method</b>	<b>Parameter</b>	<b>Quality Control Check</b>	<b>Frequency</b>	<b>Acceptable Criteria</b>	<b>Corrective Action</b>
SW-846 9010B/9012A (Cont.)	Cyanide (Cont.)	Distilled Standards (one high and one low)	Once per multipoint calibration	Within $\pm 15\%$ of expected value	<ul style="list-style-type: none"> <li>- Check system.</li> <li>- Document corrective action</li> <li>- Repeat as needed to meet criteria prior to analysis of any samples</li> </ul>
		ICV	After initial calibration	$\%R \pm 15\%$ of expected value	<ul style="list-style-type: none"> <li>- Check system.</li> <li>- Document corrective action</li> <li>- Repeat ICV</li> <li>- Repeat initial calibration</li> </ul>
		Method blank	One per sample batch	Concentration of analytes $< \frac{1}{2}$ PQL	<ul style="list-style-type: none"> <li>- Reanalyze blank.</li> <li>- If still exceeds criteria, clean work area and reanalyze blank. Do not analyze samples until problem is corrected. Document corrective action.</li> <li>- Reanalyze affected samples.</li> </ul>
		LCS	One per batch of $\leq 20$ samples	Percent recoveries and RPDs as shown in Table 3.2	<ul style="list-style-type: none"> <li>- Check calibration</li> <li>- Reextract and reanalyze LCS and associated samples</li> <li>- Discuss in case narrative and flag data</li> </ul>

**Table 6.1 (Continued)**  
**Summary of Internal Quality Control and Corrective Action Requirements**

Analytical Method	Parameter	Quality Control Check	Frequency	Acceptable Criteria	Corrective Action
SW-846 9010B/9012A (Cont.)	Cyanide (Cont.)	MS/MSD	One pair per batch of $\leq 20$ from each SITE (only MS is needed for TCLP samples)	Percent recoveries and RPDs as shown in Table 3.2	<ul style="list-style-type: none"> <li>- Check LCS.</li> <li>- Flag data if LCS is acceptable.</li> <li>- If LCS is unacceptable, re-extract and reanalyze all samples associated with LCS and MS/MSD.</li> <li>- Discuss in case narrative.</li> </ul>
EPA 351.2/ EPA 350.1	TKN/ Total Organic Nitrogen	<u>Field QC:</u> Equipment Blank (field QC samples are not required for disposal samples)	One per week per SITE	Analyte concentrations $\leq$ PQL	<ul style="list-style-type: none"> <li>- Check method blank for possible laboratory problem. Document corrective action.</li> <li>- Reanalyze equipment blank</li> <li>- Flag data and discuss in technical report where appropriate</li> </ul>
		Field Duplicate (field QC samples are not required for disposal samples)	One per 10 samples per matrix	RPD $\leq 50\%$ for soils and waters	<ul style="list-style-type: none"> <li>- Review and discuss in technical report</li> <li>- Flag data where appropriate</li> </ul>
		<u>Laboratory QC:</u> Initial Calibration	Prior to analysis of each batch of samples	$r \geq 0.995$	<ul style="list-style-type: none"> <li>- Check system.</li> <li>- Document corrective action</li> <li>- Repeat as needed to meet criteria prior to analysis of any samples</li> </ul>
		ICV	After initial calibration	%R $\pm 10\%$ of expected value	<ul style="list-style-type: none"> <li>- Check system.</li> <li>- Document corrective action</li> <li>- Repeat ICV</li> <li>- Repeat initial calibration</li> </ul>

**Table 6.1 (Continued)**  
**Summary of Internal Quality Control and Corrective Action Requirements**

<b>Analytical Method</b>	<b>Parameter</b>	<b>Quality Control Check</b>	<b>Frequency</b>	<b>Acceptable Criteria</b>	<b>Corrective Action</b>
EPA 351.2/ EPA 350.1 (Cont.)	TKN/ Total Organic Nitrogen (Cont.)	CCV	After every 10 samples	%R $\pm$ 10% of expected value	<ul style="list-style-type: none"> <li>- Check system.</li> <li>- Document corrective action</li> <li>- Repeat CCV</li> <li>- Repeat initial calibration</li> </ul>
		Method blank	One per sample batch	Concentration of analytes < ½ PQL	<ul style="list-style-type: none"> <li>- Reanalyze blank.</li> <li>- If still exceeds criteria, clean work area and reanalyze blank. Do not analyze samples until problem is corrected. Document corrective action.</li> <li>- Reanalyze affected samples.</li> </ul>
		LCS	One per batch of $\leq$ 20 samples	Percent recoveries and RPDs as shown in Table 3.2	<ul style="list-style-type: none"> <li>- Check calibration</li> <li>- Reextract and reanalyze LCS and associated samples</li> <li>- Discuss in case narrative and flag data</li> </ul>
		MS/MSD	One pair per batch of $\leq$ 20 from each SITE	Percent recoveries and RPDs as shown in Table 3.2	<ul style="list-style-type: none"> <li>- Check LCS.</li> <li>- Flag data if LCS is acceptable.</li> <li>- If LCS is unacceptable, re-extract and reanalyze all samples associated with LCS and MS/MSD.</li> <li>- Discuss in case narrative.</li> </ul>



**Table 6.1 (Continued)**  
**Summary of Internal Quality Control and Corrective Action Requirements**

Analytical Method	Parameter	Quality Control Check	Frequency	Acceptable Criteria	Corrective Action
SW-846 7196A	Hexavalent Chromium	<u>Field QC:</u> Equipment Blank (field QC samples are not required for disposal samples)	One per week per site	Analyte concentrations $\leq$ PQL	- Check method blank for possible laboratory problem. Document corrective action. - Reanalyze equipment blank - Flag data and discuss in technical report where appropriate
		Field Duplicate (field QC samples are not required for disposal samples)	One per 10 samples per matrix	RPD $\leq$ 50% for soils and waters	- Review and discuss in technical report - Flag data where appropriate
		<u>Laboratory QC</u> Initial calibration (ICAL) (minimum three standards and a blank)	Daily initial calibration prior to sample analysis	$r \geq 0.995$	Correct problem and repeat initial calibration
		ICV	Before beginning a sample run.	Value of ICV within $\pm 10\%$ of expected value (ICV)	Correct problem and verify second source standard. If that fails, then repeat calibration and reanalyze all samples since last successful calibration
		Continuing calibration verification (CCV)	After every 15 samples	Value of CCV within $\pm 10\%$ of expected value	Correct problem then repeat CCV and reanalyze all samples since last successful calibration verification.
		MS/MSD (aqueous)	1 pair per 20 water samples	Percent recoveries and RPDs as shown in Table 3.2	- Flag data if LCS is acceptable. - If LCS is unacceptable, re-extract and reanalyze all samples associated with LCS and MS/MSD. - Discuss in case narrative.

**Table 6.1 (Continued)**  
**Summary of Internal Quality Control and Corrective Action Requirements**

Analytical Method	Parameter	Quality Control Check	Frequency	Acceptable Criteria	Corrective Action
SW-846 7196A (Cont.)	Hexavalent Chromium (Cont.)	Sample matrix verification (also known as matrix spike)	Once for every sample matrix analyzed	Percent recoveries and RPDs as shown in Table 3.2	If check indicates interference, dilute and reanalyze sample; persistent interference indicates the need to use alternative method or analytical conditions, or to use method of standard additions.
		Method blank	One per preparatory batch	No analytes detected $\leq \frac{1}{2}$ RL	Correct problem, then see criteria in box D-4; if required, reprep then reanalyze method blank and all samples processed with the contaminated blank.
		LCS	One LCS per preparatory batch	Percent recoveries and RPDs as shown in Table 3.2	Correct problem, then reprep and reanalyze the LCS and all samples in the associated batch for failed analytes in all samples in the associated preparatory batch, if sufficient sample material is available (see full explanation in Appendix DoD-D)
		Soluble and insoluble hexavalent chromium MSD / MSD (solid)	One pair per 20 samples per soil matrix	Percent recoveries and RPDs as shown in Table 3.2	- Flag data if LCS is acceptable. - If LCS is unacceptable, re-extract and reanalyze all samples associated with LCS and MS/MSD.
			One per aqueous matrix	%R 85-115%	- Discuss in case narrative.
		Interference verifications			Check system, then dilute and reanalyze; document in case narrative

**Table 6.1 (Continued)**  
**Summary of Internal Quality Control and Corrective Action Requirements**

Analytical Method	Parameter	Quality Control Check	Frequency	Acceptable Criteria	Corrective Action
SW-846 9056 and EPA 300.0	Nitrate	<u>Field QC:</u>	One per week per SITE	Analyte concentrations $\leq$ PQL	- Check method blank for possible laboratory problem. Document corrective action.
	Nitrite	Equipment Blank (field QC samples are not required for disposal samples)			- Reanalyze equipment blank - Flag data and discuss in technical report where appropriate
		Field Duplicate (field QC samples are not required for disposal samples)	One per 10 samples per matrix	RPD $\leq$ 50% for soils and waters	- Review and discuss in technical report - Flag data where appropriate
		<u>Laboratory QC</u> Initial calibration (ICAL) (minimum three standards and a blank)	Daily initial calibration prior to sample analysis	$r \geq 0.995$	Correct problem and repeat initial calibration
		Second source calibration verification (also known as independently prepared check standard)	Before beginning a sample run.	Value of second source within $\pm 10\%$ of expected value (initial source)	Correct problem and verify second source standard. If that fails, then repeat calibration and reanalyze all samples since last successful calibration
		Continuing calibration verification (CCV)	After every 10 samples	Value of CCV within $\pm 10\%$ of expected value	Correct problem then repeat CCV and reanalyze all samples since last successful calibration verification.

**Table 6.1 (Continued)**  
**Summary of Internal Quality Control and Corrective Action Requirements**

<b>Analytical Method</b>	<b>Parameter</b>	<b>Quality Control Check</b>	<b>Frequency</b>	<b>Acceptable Criteria</b>	<b>Corrective Action</b>
SW-846 9056 and EPA 300.0 (Cont.)	Nitrate Nitrite (Cont.)	Sample matrix verification (also known as matrix spike)	Once for every sample matrix analyzed	Percent recoveries and RPDs as shown in Table 3.2	If check indicates interference, dilute and reanalyze sample; persistent interference indicates the need to use alternative method or analytical conditions, or to use method of standard additions.
		Method blank	One per preparatory batch	No analytes detected $\leq \frac{1}{2}$ RL	Correct problem, then see criteria in box D-4; if required, reprep then reanalyze method blank and all samples processed with the contaminated blank.
		LCS	One LCS per preparatory batch	Percent recoveries and RPDs as shown in Table 3.2	Correct problem, then reprep and reanalyze the LCS and all samples in the associated batch for failed analytes in all samples in the associated preparatory batch, if sufficient sample material is available (see full explanation in Appendix DoD-D)
		MSD or sample duplicate	One per every 10 project samples per matrix	Percent recoveries and RPDs as shown in Table 3.2	Examine the project-specific DQOs. Contact the client as to additional measures to be taken.

**Table 6.1 (Continued)**  
**Summary of Internal Quality Control and Corrective Action Requirements**

Analytical Method	Parameter	Quality Control Check	Frequency	Acceptable Criteria	Corrective Action
SW-846 9310	Gross Alpha and Beta	Field QC: Equipment Blank (field QC samples are not required for disposal samples)	One per week per SITE	Analyte concentrations $\leq$ RL	- Check method blank for possible laboratory problem. Document corrective action. - Reanalyze equipment blank - Flag data and discuss in technical report where appropriate
		Field Duplicate (field QC samples are not required for disposal samples)	One per 10 samples per matrix	RPD $\leq$ 50% for soils and waters	- Review and discuss in technical report - Flag data where appropriate
		Sample matrix verification (also known as matrix spike)	Once for every sample matrix analyzed	Percent recoveries and RPDs as shown in Table 3.2	If check indicates interference, dilute and reanalyze sample; persistent interference indicates the need to use alternative method or analytical conditions, or to use method of standard additions.
		Method blank	One per preparatory batch	No analytes detected $\leq$ $\frac{1}{2}$ RL	Correct problem, then see criteria in box D-4; if required, reprep then reanalyze method blank and all samples processed with the contaminated blank.

**Table 6.1 (Continued)**  
**Summary of Internal Quality Control and Corrective Action Requirements**

Analytical Method	Parameter	Quality Control Check	Frequency	Acceptable Criteria	Corrective Action
SW-846 9310 (Cont.)	Gross Alpha and Beta (Cont.)	LCS	One LCS per preparatory batch	Percent recoveries and RPDs as shown in Table 3.2	Correct problem, then reprep and reanalyze the LCS and all samples in the associated batch for failed analytes in all samples in the associated preparatory batch, if sufficient sample material is available (see full explanation in Appendix DoD-D)
		MSD or sample duplicate	One per every 10 project samples per matrix	Percent recoveries and RPDs as shown in Table 3.2	Examine the project-specific DQOs. Contact the client as to additional measures to be taken.
TH-NAS-3004	Thorium	<u>Field QC:</u> Equipment Blank (field QC samples are not required for disposal samples)	One per week per SITE	Analyte concentrations $\leq$ RL	- Check method blank for possible laboratory problem. Document corrective action. - Reanalyze equipment blank - Flag data and discuss in technical report where appropriate
		Field Duplicate (field QC samples are not required for disposal samples)	One per 10 samples per matrix	RPD $\leq$ 50% for soils and waters	- Review and discuss in technical report - Flag data where appropriate

**Table 6.1 (Continued)**  
**Summary of Internal Quality Control and Corrective Action Requirements**

<b>Analytical Method</b>	<b>Parameter</b>	<b>Quality Control Check</b>	<b>Frequency</b>	<b>Acceptable Criteria</b>	<b>Corrective Action</b>
		Sample matrix verification (also known as matrix spike)	Once for every sample matrix analyzed	Percent recoveries and RPDs as shown in Table 3.2	If check indicates interference, dilute and reanalyze sample; persistent interference indicates the need to use alternative method or analytical conditions, or to use method of standard additions.
		Method blank	One per preparatory batch	No analytes detected $\leq \frac{1}{2}$ RL	Correct problem, then see criteria in box D-4; if required, reprep then reanalyze method blank and all samples processed with the contaminated blank.
		LCS	One LCS per preparatory batch	Percent recoveries and RPDs as shown in Table 3.2	Correct problem, then reprep and reanalyze the LCS and all samples in the associated batch for failed analytes in all samples in the associated preparatory batch, if sufficient sample material is available (see full explanation in Appendix DoD-D)
		MSD or sample duplicate	One per every 10 project samples per matrix	Percent recoveries and RPDs as shown in Table 3.2	Examine the project-specific DQOs. Contact the client as to additional measures to be taken.

## **6.3 FIELD MEASUREMENT PROCEDURES**

Field measurements of temperature, pH, specific conductance (conductivity), turbidity, and water levels will be performed at the time of sample collection. Water levels also will be taken prior to purging the monitoring wells.

### **6.3.1 Turbidity, pH, Conductivity and Temperature Measurement Procedures**

Field measurement of water samples will be conducted using a portable Horiba™ Model U-22 measuring unit. These Horiba units will be calibrated each day prior to use. A calibration fluid is included with this unit from the manufacturer to calibrate each of the various parameters. Measurements of temperature, pH, specific conductance and turbidity will be collected with this unit.

### **6.3.2 Water Level Measurements**

Water level measurements will be made using electric water level indicators. Water levels will be measured (0.01 foot) and recorded for monitoring wells at the time of completion and prior to purging.

### **6.3.3 Headspace Measurements**

Screening measurements of organic vapor in soil samples will be collected using a PID. The detectors will be operationally checked every day against source gasses. The units will also be periodically checked during periods of continued use.

### **6.3.4 Organic Vapor Measurement**

Measurements of organic vapor in the atmosphere will be collected using a PID. The detector will be operationally checked every day against source gasses. The unit will also be periodically checked during periods of continued use.

### **6.3.5 Radiological Survey**

A radiological survey will be performed at specific locations where radioactive contamination is possible. Gross alpha and gross beta radiation will be measured using a Geiger Mueller survey meter. The meter will be operationally checked each day against a check source. The check source will also be used periodically throughout the day to ensure the meter is functioning properly.

## **6.4 TOTAL HARDNESS PROCEDURE**

Total Hardness by SW6010B is a calculated value using Standard Methods (SM) number 2340B. It is computed from the concentrations of calcium and magnesium obtained from the SW6010B analysis. Quality control criteria can be obtained using the appropriate information from the SW6010B method on Tables 3.2, 3.4 and 6.1. The equation is:

$$\text{Hardness} = 2.497 [\text{Ca, mg/L}] + 4.118 [\text{Mg, mg/L}] .$$